ANALYSIS OF MAGNESIA WATER FOUND NEAR MADISON, KAN.

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Read before the Academy December 29, 1899.

The following is an analysis of well-water from the farm of Mr. Arnold Girard, Madison, Kan., section 2, township 22 south, range 12 east; depth of well about thirty feet:

Substances (estimated) per liter.		Corresponding to the following salts, calculated in 1,000,000 parts:	
SiO_2	0.0128 grams.	Silica (SiO_2)	13 parts.
Fe_2O_3 and Al_2O_3	0.0118 "	Clay bases(Fe_2O_3 and Al_2O_3),	12 "
CaO	0.5712 "	Magnesium sulph. ($MgSO_4$),	1,903 "
MgO	0.6403 "	Calcium sulphate ($CaSO_4$),	830 "
Na_2O	0.7042 "	Calcium carbonate($CaCO_3$),	396 "
Na_2CO_3	0.0636 "	Sodium sulphate (Na_2SO_4),	1,380 "
SO_3	2.5446 "	Sodium carbonate (Na_2CO_3),	63 "
Cl	0.0698 "	Sodium chlorate (NaCl)	115 "

THE MUSCOTAH ARTESIAN WELLS.

BY E. B. KNERR, MIDLAND COLLEGE, ATCHISON.

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Along the base of the east bluffs of the Grasshopper valley, about one and a half miles south of Muscotah, there are a series of interesting low, marshy mounds. The mounded area on the farm of Mr. H. M. Rice is about a hundred rods long by fifteen rods wide, and the mounds are five to eight feet high. About a quarter of a mile farther south, on S. H. Hubbard's farm, is another mound, about fifteen yards wide, sixty yards long, and eight or ten feet high. Two miles farther south, on James Miller's place, there are similar mounds. A swamp is usually low ground, but here the swampy ground is the highest. Early in September, 1900, Mr. Rice concluded that if he were to sink a pipe near one of these mounds he would get an artesian flow of water. He bored a test hole with a two-inch auger, and at a depth of thirty-four feet struck a flow of water so strong as to force up pebbles the size of hickory-nuts. A two-inch pipe was forced into the hole, and the water rose to overflow this when it stood fifteen feet above ground. The flow from this two-inch pipe is fifty gallons every fifty-five seconds. The water is as clear as crystal, very palatable and cold, registering a temperature of fifty-six degrees F. The water deposits a slight iron coating over the barrel into which it flows. Calcareous deposits are also found in places about the mounds, indicating mineral properties for the water.

The formation of the mounds is explained by the water pressure carrying up sand and soil and depositing it at the surface. The mounds are covered by bulrushes, cattails, and other usual swamp growth, which holds the soil, preventing its being washed down. The water springs from over the whole surface of the mounds, and away in small streams. Thus, the peculiar circumstance arises that the swamp is high ground, and the firm soil is lower. The date of the above observations was Saturday, September 22, 1900.

Analysis of the water gave the following results per liter:

SiO_2	.0280 grams.	Na_2O	.0244 grams.
SO_3	.0550 "	H_2O combined	.0746 "
Cl	.0176 "	CO_2 combined	.3644 "
FeO	.0454 "	Total	.8320 "
CaO	.1625 "	Less Cl as O	.0040 "
MgO	.0356 "	Total solids	.8280 "
K_2O	.0245 "		

The probable combination in grains, per U. S. gallon, is as follows:

SiO_2	1.6324	$MgH_2(CO_3)_2$	5.1712
NaCl	1.6907	$CaH_2(CO_3)_2$	27.4126
Na_2SO_4	1.2010	$FeH_2(CO_3)_2$	6.5471
K_2SO_4	2.6410	Total solids	48.2724
$MgSO_4$	1.9764		

WATER-SUPPLY FROM A SANITARY STANDPOINT.

BY F. O. MARVIN, C. E., UNIVERSITY OF KANSAS, LAWRENCE.

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As a close student of the animated forces of nature becomes more and more familiar with the various individual species that make up the complicated fauna and flora, and with the way in which she carries on the life processes of the different organizations, the more is he forced to a recognition of the fact that there is a constant struggle for individual existence. Life preys upon life. The higher types attack and kill the lower, appropriating them for food or getting them out of the way if inimical to their development. In turn, throughout the whole range of living organisms, the lower resists this attack and appropriation, and through the multiplicity of numbers or a counter-attack in the domain of parasitism, seeks to maintain and perpetuate its own. Just in proportion as any type acquires an ability to ward off attack from its enemies on the one hand, and on the other to utilize the vital energies of those of the lower types that can assist in any way in its own permanence, does it have chance of a natural and continuous evolution of its own traits and characteristics.

Man himself is not exempt from this struggle, but he has the advantage of a higher intelligence, which, unfortunately, he does not always exercise to his benefit. He often so orders and conducts the affairs of his daily life as to create conditions favorable to the rapid and continued development of his natural enemies, while neglecting those that favor his natural friends.

Air, water, food and the soil are the natural possessions of man, and each individual has an inalienable right to their use. If he is to derive the maximum of benefit from the exercise of this right, these elements must contain nothing that is harmful to him; that is to say, that the air must be clean, the water safe, the food good, and the soil unpolluted. Absolute purity in these elements has no practical existence, and it is useless to insist on such; but it is well within the individual right to demand that these shall be free from harmful contaminations, so that they may be used with safety. This individual right also carries with it an individual responsibility, viz., the avoidance of any personal act, whether wilful or otherwise, that may render these elements unsafe to others.

Primitive man could easily move his local habitation to one of better environment when he found the results of his own living were detrimental to either him-